

WORLDWIDE EMERGING ENVIRONMENTAL ISSUES AFFECTING THE U.S. MILITARY
Control No. (TCN) 08152 with Battelle Chapel Hill Operations for the U.S. Army Environmental Policy Institute

MAY 2009 REPORT

Note to Readers: Pages 1-13 comprise the summary and analysis of this report. Expanded details for some items are in the Appendix beginning on page 15.

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Item 1. International Standards Needed to Reduce Hi-tech SIMAD Threats

The development of artificial biology, cognitive science, nanotechnology, electromagnetic pulses, and other hi-tech advances, combined with the availability of information via the Internet and low-cost components necessary to produce hi-tech weapons by individuals or non-state actors, as well as the increase of terrorism and social unrest (often exacerbated by environmental factors), increase the threat of SIMAD (single individuals massively destructive). “E-bombs” based on electromagnetic pulses are capable of destroying the electronics in civilian aircraft; suitcase-sized electronic warfare devices can disable the power grid of an entire region; and research on computer-mediated telepathy such as Silent Talk might one day be used to intercept and distort thoughts. There are no international standards to help prevent such hi-tech systems’ future use by SIMAD. [See also *New Technologies Need New Regulations Systems* in March 2009.]

Military Implications:

As these technologies mature and advanced laboratories (private and state) spread around the world, the military should increase efforts for negotiating with its counterparts and participating in international forums to develop guidelines, legal frameworks, and standards to establish control and safety measures related to access to such technologies and equipment.

Sources:

Aircraft could be brought down by DIY 'E-bombs'

<http://www.newscientist.com/article/mg20227026.200-aircraft-could-be-brought-down-by-diy-ebombs.html>

In the final analysis, electronic warfare will decide the outcome of future military conflicts

<http://en.rian.ru/analysis/20090414/121112527.html>

Pentagon Preps Soldier Telepathy Push

<http://www.wired.com/dangerroom/2009/05/pentagon-preps-soldier-telepathy-push/>

Item 2. New International Agreement on Recycling of Ships

The International Convention for the Safe and Environmentally Sound Recycling of Ships was adopted at the International Convention held in Hong Kong, May 11-15, 2009. The new Convention covers all phases of a ship’s life and operation, from design to dismantling in an environmentally and safe manner, and the establishment of an enforcement mechanism. It also requires all vessels to maintain records of hazardous materials, for workers to be equipped with protective gear, and for recycling centers to have disposal procedures for hazardous materials. The Convention will be open for signature from September 1, 2009 to August 31, 2010 and for accession thereafter; it will enter into force 24 months after ratification by 15 States representing 40% of world merchant shipping by gross tonnage.

Military Implications:

The military should ensure that dismantling of its vessels complies with the requirements of the Convention.

Sources:

New international convention adopted to ensure safe and environmentally sound ship recycling

http://www.imo.org/About/mainframe.asp?topic_id=1773&doc_id=11368

Agreement on Ship Recycling Wins Wide Support

<http://www.nytimes.com/2009/05/15/business/energy-environment/15ship.html>

Item 3. Technological Advances with Environmental Security Implications

3.1 New Detection and Cleanup Techniques

3.1.1 Energy-saving Communications for Underwater Environmental Sensing Networks

A low-cost, low-power modem subsystem for short-range, low data-rate underwater networking is being developed by a team of computer scientists from the University of California at San Diego's Jacobs School of Engineering. The technology is based on reconfigurable hardware, and will enable the construction of low-cost, more efficient, underwater sensor networks that can capture and transmit environmental data back to land in real time.

Military Implications:

The military should follow this development for eventual consideration in future systems for monitoring of the maritime environment. Such a system can also help enforcing international marine regulations.

Source:

Toward cheap underwater sensor nets

<http://www.physorg.com/news162640918.html>

3.1.2 Nano-engineered Gold Surface Mercury Vapor Sensor

Professor Suresh Bhargava and a research team from the Industrial Chemistry Group at RMIT Univ., Melbourne, Australia, have developed a greatly improved sensor for mercury vapor, using a nano-engineered gold surface as the mercury-attracting element, producing a device which is less susceptible to interference from organic compounds, ammonia, and water vapor. The modified surface is 180% more sensitive than a non-engineered one.

Military Implications:

The military should investigate this technique for possible use in systems for detecting mercury pollution in the environment.

Source:

Measuring mercury with nanotechnology

<http://www.rmit.edu.au/browse;ID=xwzx3dxlgxzi>

3.2 Increasing Energy Efficiency Technologies

3.2.1 Lithium-sulphur Battery Problem Solved by Nanotechnology

Researchers led by Prof. Linda Nazar at the Univ. of Waterloo, Ontario, have developed a cathode nanostructure for a lithium-sulphur battery that can store and deliver more than three times the power of conventional lithium ion batteries, according to Nanowerk News.

Military Implications:

The military should follow this development for applicability to power supplies for environmental equipment. However, alternatives to lithium should also be sought to prevent future dependency. [See item *Future Lithium Dependency Raises New Energy Security Concerns* in March 2009 environmental security report.]

Source:

Lithium battery technology breakthrough could triple their power

<http://www.nanowerk.com/news/newsid=10689.php>

3.2.2 New Palladium-Platinum Catalyst Structure Increases Fuel Cell Efficiency

Prof. Younan Xia has led a group of scientists at Washington University and the Brookhaven National Laboratory in the development of a fuel cell catalyst nanostructure comprising a palladium core supporting dendritic platinum branches. This material and arrangement is two and a half to five times more effective than existing techniques.

Military Implications:

The military should follow this development as it is applied to environmentally friendly fuel cells.

Source:

Going platinum: New catalyst could boost cleaner fuel use

<http://www.physorg.com/news161529265.html>

Item 4. Updates on Previously Identified Issues

4.1 Stockholm Convention Updated with Nine New Chemicals

The 4th Conference of the Parties (COP4) to the Stockholm Convention on Persistent Organic Pollutants (POPs) held May 4-8, 2009, in Geneva, adopted 33 decisions including: listing nine new chemicals for elimination (in addition to the 12 already listed); implementation plans; and improved evaluation mechanisms. No agreement was reached on non-compliance mechanisms, with further discussion to be continued at COP5. Of the nine new chemicals listed under the Convention, some are banned with no exemptions for production or use: alphaHCH, beta hexachlorocyclohexane, HBB, chlordecone, and pentachlorobenzene (PeCB), while others have some specific exemptions: perfluorooctane sulfonic acid (PFOS), tetrabromodiphenyl ether and pentabromodiphenyl ether (c-pentaBDE), hexabromodiphenyl ether and heptabromodiphenyl ether (C-octaBDE), and Lindane. Exceptional use of DDT was approved in the fight against malaria until effective alternatives are found. [See also *New Compounds Considered under the Stockholm and Rotterdam Conventions* in October 2008.]

Military Implications

Although the U.S. is not Party to the Stockholm Conventions, it should be prepared to comply with the requirements when acting in countries Party. Thus, it should consider the military implications of the additional substances phaseout and—if the case—find replacements.

Sources:

UN-backed conference promotes elimination of poisonous chemicals

<http://www.un.org/apps/news/story.asp?NewsID=30686>

Summary of the Fourth Conference of the Parties to the Stockholm Convention on Persistent Organic Pollutant

<http://www.iisd.ca/vol15/enb15174e.html>

4.2 Resources Trigger Overlapping Claims for Maritime Areas [see a more detailed description in the [Appendix](#)]

May 13 was the deadline for the 128 states that became parties to the UN Convention on the Law of the Sea prior to May 1999 to submit to the Commission on the Limits of the Continental Shelf claims for extending their rights beyond the present lines. States that acceded to UNCLOS after May 1999 have 10 years from the date the Convention entered into force for them to make a submission or provide preliminary information to the CLCS. This leaves the Arctic region open to debate, since Canada and Denmark have until November 2013 and November 2014 respectively, while the U.S. has yet to ratify the LOS.

Some of the overlapping claims for extended shelf include: the South China Sea, where China is asserting sovereignty over a series of islands also claimed by neighboring countries; in the South Atlantic, with overlapping claims from the UK and Argentina; and a series of cases where the claims are linked to previous unresolved international conflicts and boundary disputes.

Meantime, the energy-rich seabed of the Caspian Sea is the object of negotiations among Russia, Kazakhstan, Azerbaijan, Turkmenistan and Iran, while also being a crucial element for EU's alternative energy supplies from Central Asia. [See also *New Developments Concerning the Arctic* in April 2009, *Disputes over Polar Regions Expands* in October 2007, and other related items in previous environmental security reports.]

Military Implications:

[Similar to previous on related issues] It is likely that discussions for clear international regulations concerning the Polar Regions and over new maritime areas will increase rapidly, opening the potential for new military roles in those regions to ensure the safety of individuals and ecosystems. Relevant military personnel should cooperate with their counterparts in other countries and international organizations in developing timely, adequate national and international regulations and enforcement procedures.

Sources: [see a more expanded list in the [Appendix](#)]

70 states meet continental shelf deadline

http://www.dur.ac.uk/ibru/news/boundary_news/?itemno=7954

Squaring off for a seabed scrap

http://www.economist.com/world/americas/displaystory.cfm?story_id=13611528

Russia warns of war within a decade over Arctic oil and gas riches

<http://www.timesonline.co.uk/tol/news/environment/article6283130.ece>

China asserts sea border claims

<http://news.bbc.co.uk/2/hi/asia-pacific/8047206.stm>

Britain and Argentina dispute rights to seabed around the Falkland Islands

<http://www.guardian.co.uk/uk/2009/apr/24/falklands-britain-argentina-dispute-seabed>

4.3 Research Labs Safety Questioned

The World Health Organization is investigating allegations that the influenza H1N1 (swine flu) virus might have arisen and been released into the environment as an accidental happening at a biological research laboratory or vaccine production facility. However, the U.S. Centers for Disease Control and Prevention is skeptical. Meantime, a Canadian researcher was caught at the border trying to smuggle 22 vials with genetic material linked to the Ebola virus from Winnipeg's National Microbiology Laboratory into the U.S. [See also *Dangers Increase from*

“Amateur” Genetic Engineering; the Biological Weapons Convention to be Updated in December 2008 and other items in previous environmental security reports on this theme.]

Military Implications:

In addition to regular review of safety measures at military biological facilities, expert military personnel should explore how they might help their civilian counterparts to improve security of their biological research facilities.

Source:

Swine Flu May Be Human Error; WHO Investigates Claim (Update1)

<http://www.bloomberg.com/apps/news?pid=20601087&sid=afrdATVXPEAk&refer=worldwide>

Canadian accused of smuggling Ebola

<http://cnews.canoe.ca/CNEWS/Crime/2009/05/14/9453961-sun.html>

4.4 Maldives to Become World’s First Carbon Neutral Country in 10 Years

The Maldives, one of the countries most affected by climate change, has become the seventh country of the UNEP-led Climate Neutral Network (CN Net), announcing that in 10 years it wants to become the world’s first carbon neutral country by fully switching to renewable sources of energy.

Military Implications:

It would be interesting to follow Maldives’ strategy and results for eventual implementation in other small developing countries that are struggling with energy security and pollution as well as for lessons learned that might be applied to military installations.

Source:

Maldives joins UN emissions scheme in drive to be first carbon neutral country

<http://www.un.org/apps/news/story.asp?NewsID=30697&Cr=climate&Cr1=change>

4.5 Steps for an International Regime for Space Debris and Space Traffic Control System

There is general agreement that some international regime should be developed to address the increasing problem of space debris, and space safety in general. After the 5th European Conference on Space Debris held in April at ESA’s Space Operations Centre in Darmstadt, Germany, a Congress of technical and legal experts was held in Montreal, focusing specifically on the legal aspects and guidelines for debris mitigation. The possibilities mentioned were a mechanism similar to the Missile Technology Control Regime, or the Limited Test Ban Treaty, along with an eventual international space traffic control system. The recommendations will be further discussed at the next workshop to be held at the University of Cologne in May 2010. Several nations such as Russia, France, Germany and Japan have some form of space surveillance capability, the best being the US Space Surveillance Network (SSN), which is capable of tracking objects larger than 5 cm (approx. 2 inches) orbiting in Low Earth Orbit. The DOD’s Commercial and Foreign Entities pilot program, which makes collision avoidance information available to commercial space users, would become an operational program later this year. [See also *International Satellite Collision Triggers Regulations Review* in February 2009 and other related items in previous environmental security reports.]

In a related event, an asteroid missed the Earth by 48,000 miles—80% closer to the earth than the moon—and no one knew it was coming. If it had hit the earth, possibly 800 square miles would have been wiped out. “NASA’s Jet Propulsion Laboratory reported that on March 2,

asteroid 2009 DD45 came within about 48,000 miles of Earth. In astronomical terms, that's way too close for comfort. And yet during President Barack Obama's most recent press conference, no reporter asked him about this just-missed catastrophe. The fact is, the world hardly noticed" and "Asteroid 2009 DD45 was estimated to be between 69 and 154 feet in diameter. An asteroid that size exploded over Siberia in 1908 and flattened more than 800 square miles of forest, killing everything in its path. No one had a clue that 2009 DD45 was out there or that it was basically on a years-in-the-making possible collision course with our planet. The need for the governments of the world to come together to formulate a plan?"

Military implications:

In addition to the DOD's Commercial and Foreign Entities program, the military should increase cooperation with military counterparts and civilian organizations around the world to explore joint research programs and design of a legal framework to increase space security.

Sources:

Key findings from the 5th European Conference on Space Debris

http://www.esa.int/SPECIALS/Space_Debris/SEMYN9LTYRF_0.html

An Urgent Call To Action On Space Debris

http://www.spacedaily.com/reports/An_Urgent_Call_To_Action_On_Space_Debris_999.html

Making The Space Environment Safer For Civil And Commercial Users

http://www.spacedaily.com/reports/Making_The_Space_Environment_Safer_For_Civil_And_Commercial_Users_999.html

Asteroid 2009 DD45 Misses Earth

http://www.associatedcontent.com/article/1527316/asteroid_2009_dd45_misses_earth.html

4.6 Advancements on Non-proliferation and Nuclear Disarmament

The 3rd conference of the preparatory committee for the May 2010 review of the Nuclear Non-Proliferation Treaty concluded successfully, agreeing on a president and agenda. Meanwhile, the international Conference on Disarmament agreed on a working plan that includes negotiation of a fissile material cutoff treaty; a ban on space-based weapons—proposed by Russia and China; and a comprehensive nuclear disarmament proposed by India and Pakistan.

The International Atomic Energy Agency is considering proposals for establishing an international center for production and distribution of civilian nuclear power plant fuel. The main proposals are from Russia, which offered to establish an international fuel enrichment station in Siberia, a German proposal that calls for an IAEA enrichment site on "internationalized soil;" and from Kazakhstan, that offered hosting a nuclear fuel bank. [See also *Nuclear Security* in October 2008 and other related items in previous environmental security reports.]

Military Implications:

Since the new US Administration has voiced interest in non-proliferation, the military should assess all the opportunities to facilitate the NPT negotiations and international cooperation to improve nuclear safety, as well as recommend policy, training, and institutional or physical changes to implement the recommendations.

Sources: [see a more expanded list in the [Appendix](#)]

Agenda set for UN-backed 2010 review of Nuclear Non-Proliferation Treaty

<http://www.un.org/apps/news/story.asp?NewsID=30816&Cr=npt&Cr1>

Obama to Support Compromise at U.N. Disarmament Talks

http://gsn.nti.org/gsn/nw_20090527_4184.php

Big names and bucks back nuclear 'bank'

<http://www.washingtonpost.com/wp-dyn/content/article/2009/05/19/AR2009051902267.html>

4.7 Climate Change

4.7.1 Scientific Evidences and Natural Disasters

Weather pattern changes observed now in Australia were not expected to manifest until 2020, says Professor Ian Lowe, one of the country's most prominent climate change scientists, who made such estimates 20 years ago.

The Assessment Report on Climate Change and its Consequences in Russian Federation, by the Russian Federal Service for Hydrometeorology and Environmental Monitoring, notes that over the past century, the average surface air temperature in Russia has risen by nearly 1.3°C, almost twice as much as the global mean. The assessment also details potential changes in permafrost by 2020 and 2050 due to climate change. Permafrost covers 60% of the land in Russia.

4.7.2 Food and Water Security

The 17th session of the Commission on Sustainable Development held May, 4-15, 2009, focused on the interdependence and the role of agriculture and climate change. The meeting's final agreement calls for some urgent policies such as: developing and implementing comprehensive strategies for dealing with climate change, drought, desertification and natural disaster; sustainable management of water and land resources; sustainable agriculture; and providing secure access to food and social safety nets. The CSD's decisions will be forwarded for consideration by the July 2009 meeting of the Economic and Social Council.

For addressing their food and water security, several food-importing countries including China, South Korea, Saudi Arabia, and the UAE, have started buying or leasing land in poor countries in Africa, Latin America, Central Asia, and Southeast Asia, for producing food. The International Food Policy Research Institute, that conducted the study at the request of the UN, estimates that 2.5 million hectares (about 20% of all EU farmland) in poor countries have been subject to transactions or talks involving foreigners since 2004, in deals estimated to worth \$20 billion-\$30 billion, which is at least 10 times as much as an emergency package for agriculture recently announced by the World Bank and 15 times more than the American administration's new fund for food security. Some of the countries involved are Sudan—the recipient of the largest food-aid operation in the world, and Pakistan, which is promising Gulf investors a security force of 100,000 to protect the assets. Left unchecked, this trend could further exacerbate the turmoil in the food market and potentially lead to conflicts over land and food.

As glaciers in the Andes are melting away, tensions are rising between those living upstream and downstream, small farmers and agribusinesses, and even among states. As per the World Bank's estimates, most of the Andes' glaciers will disappear within 20 years, threatening the water supplies of nearly 80 million people, and jeopardizing energy security in Bolivia, Ecuador and Peru, which depend on hydropower for about half their electricity.

4.7.3 Migration

Rising sea levels and extreme heat due to climate change, coupled with environmental degradation, would force Australia's indigenous people to move off their traditional lands, resulting in "cultural genocide" according to the Human Rights Commission's annual Native Title Report.

The Chinese government estimates that 150 million people will have to be resettled, mainly due to desertification, water shortages exacerbated by over-irrigation and climate change, and population increase. The Minqin regional population rose from 860,000 to 2.3 million over the last 60 years.

4.7.4 Melting Glaciers and Sea Ice

Bolivia's 18,000-year-old Chacaltaya glacier completely melted away this year. Bolivian scientists surveying the glacier since the 1990s predicted that it would survive until 2015. As per the World Bank's estimates, most of the Andes' glaciers will disappear within 20 years.

Temperatures in the Tibetan plateau rose by 0.32°C every 10 years since 1961—much higher than the average national rise of 0.05°-0.08°C, thus accelerating glaciers' melting, reports the China Meteorological Bureau.

4.7.5 Rising Sea Levels

New melting estimates and their consequences show that melting of one of the world's largest ice sheets could alter the Earth's field of gravity and even its rotation, and disproportionately raise more sea levels on the west and east coasts of North America.

4.7.6 Health

At the 62nd World Health Assembly, held May 18-22, 2009, in Geneva, Switzerland, member States unanimously agreed to the resolution and work plan for scaling up the WHO's technical assistance to countries for assessing and addressing the implications of climate change for health and health systems. The work plan is organized around four objectives: advocacy and awareness raising; engagement in partnerships with other UN organizations and sectors to ensure that health issues are included in adaptation and mitigation policies; supporting the generation of scientific evidence; and strengthening health systems to cope with the threats posed by climate change.

The UNFCCC Secretariat posted the submission by WHO, which will be examined in the 6th session of the Ad Hoc Groups on Long-Term Cooperative Action in Bonn, Germany, to be held June 1-12, 2009. The paper, "Protecting the health of vulnerable people from the humanitarian consequences of climate change and climate related disasters" is based on the recognition that climate change mitigation and adaptation are important for protecting the health of vulnerable populations and aims to document the range of risks that climate change poses to human health associated with humanitarian emergencies.

WHO also launched a report, "Protecting Health from Climate Change: Global research priorities," during the meeting of Commonwealth Health Ministers held in Geneva, Switzerland. The report, based on a global e-consultation and meeting of over 70 leading experts, proposes a series of recommendations on the most important directions for future work in five research areas: assessing risks, identifying the most effective interventions, guiding health-promoting mitigation and adaptation decisions in other sectors, improving decision-support, and estimating the costs of protecting health from climate change.

4.7.7 Computer Modeling

MIT Integrated Global Systems Model, a comprehensive computer simulation including global economic activity and climate processes, involving 400 runs with slight variations of parameters, revealed—compared to 2000, a median probability of surface warming of 5.2°C (9.4°F) by 2100, with a 90% probability of 3.5°-7.4°C (6.3°-13.3°F). A 2003 median projection was a warming of 2.4°C (4.3°F). However, the estimates might be understatements, as they don't include positive feedbacks from phenomena like methane release as consequence of arctic permafrost melting. The model was run and illustrated for situations with and without “policy change” for curbing greenhouse gas emissions. [see [figure](#) in the Appendix]

4.7.8 Adaptation

During the 17th session of CSD, UNEP launched a new report, “The Environmental Food Crisis: The Environment’s Role in Averting Future Food Crises,” which provides an overview of how environmental stresses such as climate change, water stress, invasive pests and land degradation may impact food prices and world food security. The report stresses the need for a Green Revolution in Africa, noting the challenges of water scarcity, lack of infrastructure and impacts from climate change, and proposes a seven-point plan to reduce the risk of hunger and food insecurity in the 21st century. At the launch, UNEP Executive Director Achim Steiner stated that reversing environmental degradation and investing in ecological infrastructure such as forests, soils, and water bodies is part of the Green Economy solution. He also pointed to opportunities to diversify livelihoods and incomes via the emerging carbon markets, including renewable energy and income from conserving forest, soil and vegetation cover to sequester carbon.

4.7.9 Post-Kyoto Negotiations

The text for a new treaty on the reduction of greenhouse gas emissions to be negotiated at the December meeting in Copenhagen was posted online. The 53-page negotiating text includes four sections: “A shared vision for long-term cooperative action; Enhanced action on adaptation; Enhanced action on mitigation; Chapter IV: Enhanced action on financing, technology and capacity-building.” The next talks on the negotiating text will be held in Bonn, June 1-12.

Military Implications:

[Same as previous on this issue] The military should identify all its resources and programs for reducing GHGs and responding to effects of climate change, update information continuously, forecast how it might be called upon for both mitigation and adaptation, and perform a gap analysis in anticipation of future requests. International discourse over climate change is increasing the development of international policies and strategies to mitigate and adapt to climate change.

Sources: [see a more expanded list in the [Appendix](#)]

Copenhagen the Focus as Australia Shows Effects of Climate Change

<http://www.theepochtimes.com/n2/content/view/17301/>

Assessment Report on Climate Change and Its Consequences in Russian Federation

http://climate2008.igce.ru/v2008/pdf/resume_ob_eng.pdf

Advance unedited adopted text of CSD Decisions:

http://www.un.org/esa/dsd/resources/res_pdfs/csd-17/Final_text.pdf

Buying farmland abroad – Outsourcing's third wave

http://www.economist.com/displaystory.cfm?story_id=13692889

Glaciers go, leaving drought, conflict and tension in Andes

<http://www.dailyclimate.org/tdc-newsroom/2009/05/glaciers-go-leaving-drought-conflict-and-tension>

Native Title Report 2008

http://www.humanrights.gov.au/social_justice/nt_report/ntreport08/index.html

'We have taken every measure we can think of to stop the desert moving closer and submerging our crops and villages'

<http://www.guardian.co.uk/world/2009/may/18/china-ecorefugees-farming>

'Climate threat' to Tibet region

<http://news.bbc.co.uk/2/hi/asia-pacific/8035774.stm>

Melting ice could cause gravity shift

<http://www.independent.co.uk/news/science/melting-ice-could-cause-gravity-shift-1685201.html>

World Health Assembly closes with resolutions on public health

http://www.who.int/mediacentre/news/releases/2009/world_health_assembly_20090522/en/index.html

Climate change odds much worse than thought

<http://web.mit.edu/newsoffice/2009/roulette-0519.html>

The Environmental Food Crisis: The Environment's Role in Averting Future Food Crises:

<http://www.grida.no/publications/rr/food-crisis/>

Ad Hoc Working Group on Long-Term Cooperative Action under the Convention

<http://unfccc.int/resource/docs/2009/awglca6/eng/08.pdf>

4.8 Nanotechnology Safety Issues

More detailed descriptions of the following nanotechnology issues are in the [Appendix](#)

- *International Approaches to the Regulatory Governance of Nanotechnology* report by the Regulatory Governance Initiative (RGI) at Carleton University, Ottawa ON ([more](#))
- New Estimation Technique for Nanoparticles in the Environment ([more](#))
- Proposal for Establishing an Arab Council on Nanotechnology (ACON) ([more](#))
- New South Wales (Australia) will push for national mandatory labeling of nanoparticles ([more](#))
- Wilson Center's Project on Emerging Nanotechnologies has issued a new report that calls for the creation of a new Department of Environmental and Consumer Protection ([more](#))
- Research Awards on Nanotech and Energy Presented to Nine Projects ([more](#))

Military Implications:

[Same as previous on this issue] Relevant military personnel should review the information generated by such activities to improve military and contractor practices, as well as to assist and cooperate with the organizations working on those issues for enriching their studies.

Sources:

International Approaches to the Regulatory Governance of Nanotechnology (report)

http://www.carleton.ca/regulation/publications/Nanotechnology_Regulation_Paper_April2009.pdf

Novel Approach Estimates Nanoparticles In Environment

<http://news.duke.edu/2009/05/nanotitan.html>

Al-Quds Nanotech Research Lab

http://www.eng.alquds.edu/nrl/nrl_site.swf

NSW pushes for nano risk labels

<http://www.smh.com.au/national/nsw-pushes-for-nano-risk-labels-20090504-asmk.html?page=1>

Former EPA Official Calls For New Environmental & Consumer Protection Agency

<http://www.nanotechproject.org/news/archive/davies4/>

Research Awards on Nanotech and Energy

<http://www.eon.com/en/unternehmen/21278.jsp>

Item 5. Reports and Information Suggested for Review

5.1 Improved Governance Needed for Reducing Risks of Environmental Disaster

2009 Global assessment report on disaster risk reduction: risk and poverty in a changing climate is the first biennial global assessment of disaster risk reduction coordinated by the UN International Strategy for Disaster Reduction (UNISDR). The study is a comprehensive analysis of disasters and their effects, with concrete suggestions. It notes that between 1990 and 2007, global disaster risk increased by 13% as mortality, and 35% as economic loss, with low- and middle-income countries bearing far greater burden because of weak economic and governance systems. For example, Japan and the Philippines have roughly equivalent population exposure to tropical cyclones, but 17 times more people would die in the Philippines than Japan. The study identifies three primary ‘risk drivers’: unplanned urban development, vulnerable livelihoods, and ecosystem decline, each exacerbated by climate change, and proposes a 20-point action plan based on major shifts in development thinking by including preparedness in all strategies at international, national, and community levels.

The study *The View From the Frontline*, to be released in June, conducted by the Global Network of Civil Society Organizations for Disaster Reduction, focus on communities’ role in reducing disaster effects and calls for systemic changes in policy by governments. For example, the study says, education in local communities is needed to overcome a tendency to accept high disaster tolls as a matter of fate, instead of, for example, a result of lax building codes or lack of warning systems.

The Climate Gap, a study by a team from the University of California, Berkeley, documents how poor people are disproportionately affected by climate change in the U.S., and warns that a widening “climate gap” could exacerbate current and future social disparities. Therefore, the report highlights the importance of including environmental justice in climate change policies.

Military Implications:

These studies provide useful input for potential military strategies and collaboration with local governments on risk reduction actions in disaster and/or conflict prone areas, to prevent potential conflict exacerbation because of environmental disasters.

Sources:

2009 Global assessment report on disaster risk reduction: risk and poverty in a changing climate

<http://www.preventionweb.net/english/hyogo/gar/report/index.php?id=9413>

Global assessment report launched: Landmark report on poverty risk in a changing climate

<http://www.preventionweb.net/english/professional/news/v.php?id=9425&pid:50>

Secretary-General's remarks at ceremony launching The Global Assessment Report on Disaster Risk Reduction

<http://www.un.org/apps/sg/sgstats.asp?nid=3858>

The Global Network of Civil Society Organisations for Disaster Reduction

<http://www.globalnetwork-dr.org/gndr/members.html>

Studies Tie Disaster Risk to Urban Growth

<http://www.nytimes.com/2009/05/17/world/17WebDisaster.html?ref=global-home>

Report Reveals Climate Gap among Minorities, Poor in U.S.

http://college.usc.edu/geography/ESPE/documents/ReleaseClimateGap_FINAL.pdf

5.2 New Arctic Maps Detail Geological Features

The most comprehensive geological atlas of the Arctic has been published. It maps detailed information on continental plates, rock types, and highlights the potential reserves of oil, gas, and other mineral resources. It estimates that the area within the Arctic Circle might contain around 30% of the world's undiscovered gas resources and 13% of oil reserves. The research, published in *Science* magazine, is the result of data compiled over several years by an international team of northern countries researchers. Meanwhile, Durham University updated its map of the Arctic (see [Appendix](#)) highlighting the disputed territories. These publications should aid in environmental surveillance, resource exploration, and negotiation of Arctic sovereignty disputes. [See also *The Debate over Strategic Control of the Arctic is Heating Up* in July-August 2008 and other related items in previous environmental security reports.]

Military Implications:

Military personnel with Arctic responsibilities should review these maps to explore military applications and preparation for participation in future negotiations.

Sources:

New map of Arctic could point to Canadian gas, minerals

<http://www.cbc.ca/money/story/2009/05/07/tech-geological-map-arctic-marc-st-onge.html>

(See "External Links – Mirage Map Database")

Arctic's black gold mapped

<http://www.nature.com/news/2009/090528/full/news.2009.527.html>

Maritime jurisdiction and boundaries in the Arctic region

<http://www.dur.ac.uk/ibru/resources/arctic/>

APPENDIX

Reference Details

This Appendix contains expanded background information on some items.

Item 4. Updates on Previously Identified Issues

4.2 Resources Trigger Overlapping Claims for Maritime Areas [a more detailed description]

A Russia assessment of security threats up to 2020, notes that fights over the world's energy reserves could trigger military clashes, specifying the Arctic as a vulnerable area along with the Middle East, Central Asia, and the Caspian Sea.

May 13 was the deadline for the 128 states which became parties to the UN Convention on the Law of the Sea prior to May 1999 to submit to the Commission on the Limits of the Continental Shelf claims for extending their rights beyond the present lines. A total of 50 submissions were received from 43 states, while 37 states made preliminary submissions. States that acceded to UNCLOS after May 1999 have 10 years from date of the Convention entered into force for them to make a submission or provide preliminary information to the CLCS. This leaves the Arctic region open to debate, since Canada and Denmark have until November 2013 and November 2014 respectively, while the U.S. has yet to ratify the LOS.

Canada also has disputes with France over the rights to the rich oil and gas reserves of the seabed surrounding the small islands of St. Pierre and Miquelon, off the coast of Newfoundland.

One of the most complicated areas is the South China Sea, where China, the Philippines, Vietnam, Taiwan, Indonesia, and Malaysia have overlapping claims, with China asserting sovereignty over a series of islands and the respective seabed reserves.

A vast area around the Falkland Islands, South Georgia and South Sandwich Islands in the South Atlantic, with seabed rich in oil and minerals, is the object of overlapping claims from the UK and Argentina.

Countries that have also recently made submissions or informed the CLCS of their intention to claim extending their continental shelf include Cook Islands, Fiji, Benin, Somalia, Oman, Vanuatu, Ghana, Pakistan, South Africa, Nigeria, Sri Lanka, Kenya and others. In some cases, the claims are linked to previous unresolved international conflicts and boundary disputes. However, the Commission's rulings are only advisory and intended to be used for negotiations and, if necessary, arbitration.

Meantime, the energy-rich seabed of the Caspian Sea is the object of negotiations among Russia, Kazakhstan, Azerbaijan, Turkmenistan and Iran, while also being a crucial element for EU's alternative energy supplies from Central Asia. [See also *New Developments Concerning the Arctic* in April 2009, *Disputes over Polar Regions Expands* in October 2007, and other related items in previous environmental security reports.]

Military Implications:

[Similar to previous on related issues] It is likely that discussions for clear international regulations concerning the Polar Regions and over new maritime areas will increase rapidly, opening the potential for new military roles in those regions to ensure the safety of individuals

and ecosystems. Relevant military personnel should cooperate with their counterparts in other countries and international organizations in developing timely, adequate national and international regulations and enforcement procedures.

Sources:

Energy conflicts could bring military clashes, Russian security strategy warns

<http://www.guardian.co.uk/world/2009/may/13/russia-security-strategy-energy-warning>

Medvedev endorses national security strategy until 2020

<http://www.itar-tass.com/eng/level2.html?NewsID=13932213&PageNum=0>

The coldest war: Russia and U.S. face off over Arctic resources

<http://www.dailymail.co.uk/news/article-1184291/The-coldest-war-Russia-U-S-face-Arctic-resources.html>

Russia warns of war within a decade over Arctic oil and gas riches

<http://www.timesonline.co.uk/tol/news/environment/article6283130.ece>

70 states meet continental shelf deadline

http://www.dur.ac.uk/ibru/news/boundary_news/?itemno=7954&rehref=%2Fibru%2F&resubj=Boundary+news%20Headlines

More continental shelf claims submitted to the CLCS

http://www.dur.ac.uk/ibru/news/boundary_news/?itemno=7882&rehref=%2Fibru%2Fnews%2F&resubj=Boundary+news%20Headlines

Squaring off for a seabed scrap

http://www.economist.com/world/americas/displaystory.cfm?story_id=13611528

France seeks settlement to St-Pierre offshore claim

<http://www2.canada.com/topics/news/story.html?id=1588566>

China asserts sea border claims

<http://news.bbc.co.uk/2/hi/asia-pacific/8047206.stm>

Submissions, through the Secretary-General of the United Nations, to the Commission on the Limits of the Continental Shelf, pursuant to article 76, paragraph 8, of the UNCLS

http://www.un.org/depts/los/clcs_new/commission_submissions.htm

UK stakes claim to huge area of South Atlantic seabed

<http://www.guardian.co.uk/world/2009/may/11/uk-falklands-argentina-un>

Britain and Argentina dispute rights to seabed around the Falkland Islands

<http://www.guardian.co.uk/uk/2009/apr/24/falklands-britain-argentina-dispute-seabed>

Russia warns of war within a decade over Arctic oil and gas riches

<http://www.timesonline.co.uk/tol/news/environment/article6283130.ece>

4.6 Advancements on Non-proliferation and Nuclear Disarmament

Sources: (a more expanded list)

Agenda set for UN-backed 2010 review of Nuclear Non-Proliferation Treaty

<http://www.un.org/apps/news/story.asp?NewsID=30816&Cr=npt&Cr1>

Ambassador Boniface G. Chidyausiku of Zimbabwe, the chairman of the preparatory committee's third session (video)

<http://webcast.un.org/ramgen/ondemand/pressconference/2009/pc090515pm1.rm>

Third Preparatory Committee For 2010 Nuclear Non-Proliferation Treaty Review Conference Concludes Successfully With Adoption Of Consensus Report

<http://www.un.org/News/Press/docs/2009/dc3174.doc.htm>

Preparatory Committee for the 2010 Nuclear Non-Proliferation Treaty Review Conference
4 – 15 May 2009 in New York, Third Session

<http://www.un.org/disarmament/WMD/Nuclear/NPT2010Prepcom/PrepCom2009/index.html>

World cannot afford to put disarmament on backburner, Ban tells States

<http://www.un.org/apps/news/story.asp?NewsID=30679&Cr=disarmament&Cr1=proliferation>

Agenda Set for NPT Review Conference

http://gsn.nti.org/gsn/nw_20090508_6808.php

Delegates Take Key Step in Nuclear Treaty Review

http://www.examiner.com/a-2004371~Delegates_take_key_step_in_nuclear_treaty_review.html

Obama to Support Compromise at U.N. Disarmament Talks

http://gsn.nti.org/gsn/nw_20090527_4184.php

Nations Agree to Work Plan for Conference on Disarmament

http://gsn.nti.org/gsn/nw_20090529_1083.php

IAEA Governors to Consider Nuclear Fuel Bank Proposals

http://gsn.nti.org/gsn/nw_20090520_6166.php

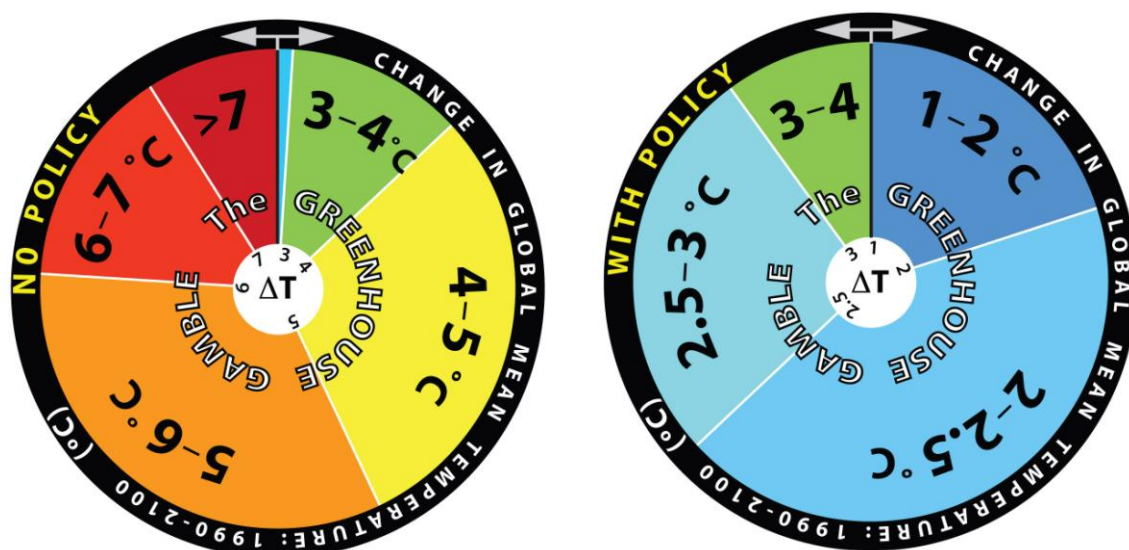
Big names and bucks back nuclear 'bank'

<http://www.washingtonpost.com/wp-dyn/content/article/2009/05/19/AR2009051902267.html>

4.7 Climate Change

4.7.7 Computer Modeling

MIT Integrated Global Systems Model; temperature increase over the next 100 years



The wheel on the left assumes that no policy is enacted. The wheel on the right depicts researchers' estimation of the range of probability of potential global warming over the next 100 years if aggressive policy change is enacted on curbing greenhouse gas emissions.

Image courtesy of the MIT Joint Program on the Science and Policy of Global Change

<http://web.mit.edu/newsoffice/2009/roulette-0519.html>

Sources: (a more expanded list)

4.7.1 Scientific Evidences and Natural Disasters

Copenhagen the Focus as Australia Shows Effects of Climate Change

<http://www.theepochtimes.com/n2/content/view/17301/>

Russia makes major shift in climate policy

http://www.nature.com/news/2009/090526/full/news.2009.506.html?s=news_rss

Assessment Report on Climate Change and Its Consequences in Russian Federation

http://climate2008.igce.ru/v2008/pdf/resume_ob_eng.pdf

4.7.2 Food and Water Security

Advance unedited adopted text of CSD Decisions:

http://www.un.org/esa/dsd/resources/res_pdfs/csd-17/Final_text.pdf

CSD website: http://www.un.org/esa/dsd/csd/csd_csd17.shtml

“Land Grabbing” by Foreign Investors in Developing Countries: Risks and Opportunities

<http://www.ifpri.org/pubs/bp/bp013.asp>

Buying farmland abroad – Outsourcing's third wave

http://www.economist.com/displaystory.cfm?story_id=13692889

China looks abroad to grow its own food

<http://www.telegraph.co.uk/news/worldnews/asia/china/1942254/China-looks-abroad-to-grow-it-s-own-food.html>

Large-Scale Foreign Land Acquisitions Could Harm Local People, Says UN-Backed Report

<http://www.un.org/apps/news/story.asp?NewsID=30920>

Huge Bolivian glacier disappears

<http://news.bbc.co.uk/2/hi/americas/8046540.stm>

Glaciers go, leaving drought, conflict and tension in Andes

<http://www.dailyclimate.org/tdc-newsroom/2009/05/glaciers-go-leaving-drought-conflict-and-tension>

Bolivia's Chacaltaya glacier is gone

<http://www.miamiherald.com/news/americas/story/1030126.html>

4.7.3 Migration

Native Title Report 2008

http://www.humanrights.gov.au/social_justice/nt_report/ntreport08/index.html

'We have taken every measure we can think of to stop the desert moving closer and submerging our crops and villages'

<http://www.guardian.co.uk/world/2009/may/18/china-ecorefugees-farming>

Climate change 'cultural genocide' for Aborigines

<http://www.spacedaily.com/2006/090504095259.4zbkjyfc.html>

4.7.4 Melting Glaciers and Sea Ice

Bolivia's Chacaltaya glacier is gone

<http://www.miamiherald.com/news/americas/story/1030126.html>

Huge Bolivian glacier disappears

<http://news.bbc.co.uk/2/hi/americas/8046540.stm>

'Climate threat' to Tibet region

<http://news.bbc.co.uk/2/hi/asia-pacific/8035774.stm>

4.7.5 Rising Sea Levels

Melting ice could cause gravity shift

<http://www.independent.co.uk/news/science/melting-ice-could-cause-gravity-shift-1685201.html>

Another study warns of threat of rising sea levels in the Northeast

<http://www.latimes.com/news/nationworld/politics/wire/sns-ap-us-sci-rising-seas,1,4691387.story>

4.7.6 Health

World Health Assembly closes with resolutions on public health

http://www.who.int/mediacentre/news/releases/2009/world_health_assembly_20090522/en/index.html

Protecting the health of vulnerable people from the humanitarian consequences of climate change and climate related disasters

<http://unfccc.int/resource/docs/2009/smsn/igo/047.pdf>

Protecting Health from Climate Change: Global research priorities

http://www.who.int/phe/news/madrid_report_661_final_lowres.pdf

4.7.7 Computer Modeling

Climate change odds much worse than thought

<http://web.mit.edu/newsoffice/2009/roulette-0519.html>

Global warming of 7C 'could kill billions this century'

<http://www.telegraph.co.uk/earth/earthnews/5357725/Global-warming-of-7C-could-kill-billions-this-century.html>

Global warming could be twice as bad as forecast

<http://www.reuters.com/article/environmentNews/idUSTRE54I6PF20090519>

4.7.8 Adaptation

Environment-Led Green Revolution Key to Future Food Security in Africa

<http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=585&ArticleID=6170&l=en&t=long>

The Environmental Food Crisis: The Environment's Role in Averting Future Food Crises:

<http://www.grida.no/publications/rr/food-crisis/>

Anchoring Agriculture within a Copenhagen Agreement A Policy brief for UNFCCC parties by FAO

http://www.fao.org/forestry/foris/data/nrc/policy_brief_sbtabonn.pdf

4.7.9 Post-Kyoto Negotiations

Ad Hoc Working Group on Long-Term Cooperative Action under the Convention

<http://unfccc.int/resource/docs/2009/awglca6/eng/08.pdf>

Another step towards new climate change pact taken with online UN publication

<http://www.un.org/apps/news/story.asp?NewsID=30854>

"It's the first time [a] real negotiating text will be on the table which can serve as a basis for governments to start drafting a Copenhagen agreed outcome."

<http://unfccc.int/resource/docs/2009/awglca6/eng/08.pdf>

4.8 Nanotechnology Safety Issues

4.8.1 International Approaches to the Regulatory Governance of Nanotechnology

The Regulatory Governance Initiative (RGI) at Carleton University, Ottawa ON, has published a new report, *International Approaches to the Regulatory Governance of Nanotechnology*, that addresses the question: "How have Canada and other jurisdictions reacted to the recent emergence of nanotechnology-based products in the marketplace (and what is the current state of affairs)?" According to the story in Nanowerk News, it contains descriptions of the policy, regulatory, and stewardship approaches undertaken, and discusses the effectiveness of these approaches.

Sources:

International Approaches to the Regulatory Governance of Nanotechnology (report)

http://www.carleton.ca/regulation/publications/Nanotechnology_Regulation_Paper_April2009.pdf

International approaches to the regulatory governance of nanotechnology

<http://www.nanowerk.com/news/newsid=10642.php>

4.8.2 New Estimation Technique for Nanoparticles in the Environment

Christine Robichaud, at Duke Univ.'s Pratt School of Engineering, and colleagues at Duke and UCLA, have developed a new way of estimating how much of a possibly hazardous material, e.g., titanium dioxide nanoparticles, is being generated, allowing future studies to assess possible risks. "We combined science and engineering knowledge with business and economic modeling to come up with what we think is the maximum amount of titanium dioxide nanoparticles out there," Robichaud said. "By taking the amount of bulk titanium dioxide produced, which is better understood, and applying the rates of new technologies to convert it to the nanoparticle form found in journal articles and patent applications, we estimated the maximum ceiling amount."

Source:

Novel Approach Estimates Nanoparticles In Environment

<http://news.duke.edu/2009/05/nanotitan.html>

4.8.3 Proposal for Establishing an Arab Council on Nanotechnology (ACON)

An expert meeting on ethics of nanotechnologies in the Arab region has called for creation of an Arab Council on Nanotechnology (ACON). According to the proposer, Dr. Mukhles Sowwan of Al-Quds University in Jerusalem, "The mission of ACON should be to raise awareness of the benefits and dangers of molecular nanotechnology, and assist in the creation and implementation of comprehensive balanced plans for responsible use of this technology."

Source:

Al-Quds Nanotech Research Lab

http://www.eng.alquds.edu/nrl/nrl_site.swf

Call to set up a nanotech Arab body

http://www.gulf-times.com/site/topics/article.asp?cu_no=2&item_no=291882&version=1&template_id=36&parent_id=16

4.8.4 New South Wales Pushes for Nanotech Risk Protection

The government of New South Wales (Australia) will push for national mandatory labeling of nanoparticles used in workplaces, and for improved testing facilities to assess the safety of new nanomaterials. Suggestions for including immediate labeling of nanoparticles in food, sunscreens and cosmetics, and that nanoparticles be treated by regulators as new chemicals were not taken.

Source:

NSW pushes for nano risk labels

<http://www.smh.com.au/national/nsw-pushes-for-nano-risk-labels-20090504-asmk.html?page=1>

4.8.5 New report on Oversight of Next Generation Nanotechnology

The Wilson Center's Project on Emerging Nanotechnologies has issued a new report that calls for the creation of a new Department of Environmental and Consumer Protection to oversee product regulation, pollution control and monitoring, and technology assessment.

Source:

Former EPA Official Calls For New Environmental & Consumer Protection Agency

<http://www.nanotechproject.org/news/archive/davies4/>

4.8.6 Research Awards on Nanotech and Energy Presented to Nine Projects

E.ON, a leading power and gas company, has presented the E.ON Research Awards to international universities and research institutes. Nine research proposals representing outstanding ideas and innovations in applications of nanotechnology to energy problems were awarded grants. One that attracted particular attention was for a sunlight-driven photocatalysis hydrogen generating process being developed by Prof. Gianluca Li Puma, of the Energy Technologies Research Institute at the Univ. of Nottingham, England.

Source:

Research Awards on Nanotech and Energy

<http://www.eon.com/en/unternehmen/21278.jsp>

Accolade for solar-hydrogen project

<http://www.physorg.com/news161870957.html>

5.2 New Arctic Maps Detail Geological Features



Maritime jurisdiction and boundaries in the Arctic region

